

(19) United States

(12) Patent Application Publication (10) Pub. No.: US 2019/0026056 A1 Wang et al.

Jan. 24, 2019 (43) Pub. Date:

(54) ELECTRONIC DEVICE WITH SENSORS AND DISPLAY DEVICES

(71) Applicant: Apple Inc., Cupertino, CA (US)

Inventors: Paul X. Wang, Cupertino, CA (US); Jie Gu, Palo Alto, CA (US)

Appl. No.: 15/729,394 (21)

(22) Filed: Oct. 10, 2017

Related U.S. Application Data

Provisional application No. 62/535,161, filed on Jul. 20, 2017.

Publication Classification

(51)	Int. Cl.	
	G06F 3/147	(2006.01)
	G06F 3/16	(2006.01)
	G06F 3/044	(2006.01)
	H04N 5/44	(2006.01)
	H04N 5/445	(2006.01)
	H04R 1/02	(2006.01)
	G10L 15/26	(2006.01)
	G06F 3/01	(2006.01)
	G10L 15/08	(2006.01)

(52) U.S. Cl.

CPC G06F 3/147 (2013.01); G10L 2015/088 (2013.01); G06F 3/044 (2013.01); H04N 5/4403 (2013.01); H04N 5/44504 (2013.01); H04R 1/028 (2013.01); G10L 15/265 (2013.01); H04R 1/023 (2013.01); G06F 3/017 (2013.01); G10L 15/08 (2013.01); G06F 2203/04106 (2013.01); G06F 2203/04108 (2013.01); H04N 2005/4428 (2013.01); H04N 2005/4432 (2013.01); HO4N 2005/4426 (2013.01); H04R 2420/07 (2013.01); G06F 3/167 (2013.01)

(57)**ABSTRACT**

An electronic device may have a housing. The housing may be characterized by a vertical axis and may have housing structures such as cylindrical housing structures with a cylindrical surface. A speaker may be mounted in the housing to provide sound through openings in the housing structures. A visual output device may be mounted in the housing to provide light through openings in the housing structures. The visual output device may include an electrophoretic display, a light-emitting diode display, or other display with an array of pixels that display images or may include other components for emitting light. During operation, voice commands may be received by a microphone in the device and action taken based on the commands and other information. The action taken may include playing sound with the speaker and providing visual output with the visual output device.

